

**PATENT**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

Application No.: 10/689,198  
Filing Date: October 20, 2003  
Applicant: Joseph D. Rainville et al.  
Group Art Unit: 1795  
Examiner: Alix Elizabeth Echelmeyer  
Title: REGENERATIVE COMPRESSOR MOTOR CONTROL FOR  
A FUEL CELL POWER SYSTEM  
Attorney Docket: 8450G-000213 (General Motors Docket No. GP-303508)

---

Mail Stop Appeal Brief - Patents  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, Virginia 22313-1450

**RESPONSE TO NOTIFICATION OF NON-COMPLIANT APPEAL BRIEF**

In response to the Notification of Non-Compliant Appeal Brief mailed October 7, 2010,

Applicants attach the corrected section "Claims Appendix."

Respectfully submitted,



\_\_\_\_\_  
Anna M. Budde  
Registration No. 35,085

October 13, 2010  
Harness, Dickey & Pierce, P.L.C.  
P.O. Box 828  
Bloomfield Hills, Michigan 48303  
(248) 641-1600

## Claims Appendix

10. A fuel cell system, comprising:

a fuel cell that processes an oxidant to produce electrical energy;

a variable capacity compressor system that supplies said oxidant to said fuel cell and that during operation of the fuel cell system, supplies said oxidant by operating in a mode selected from a normal mode below a threshold rate of 40%/s change in capacity and a rapid transient mode selected from an upward and downward variation at or above the threshold rate, said variable capacity compressor system comprising:

a compressor that compresses said oxidant; and

a compressor motor that drives said compressor

a controller that monitors a power demand from said fuel cell and that selects a power source for said compressor motor, said power source being either a main power source when operating in said normal mode or a supplemental power source when operating in said rapid transient mode which is upward wherein said supplemental power source is selected from capacitors and supercapacitors and wherein said controller controls charging of said supplemental power source comprising regenerative braking of the compressor motor that converts mechanical energy into charging current.

17. The fuel cell system of claim 10 wherein charging further comprises using power generated by said fuel cell.

20. The fuel cell system of claim 10 wherein said controller shifts said variable capacity compressor between said normal mode and said rapid transient mode based on said power demand.

21. A method of operating a fuel cell system comprising a variable capacity compressor system, comprising a variable capacity compressor that supplies an oxidant to fuel cells of the fuel cell system while the fuel cell system operates and a compressor motor that drives the compressor, the method comprising:

operating said variable capacity compressor in a normal mode at a first capacity of the fuel cell system to produce electrical power;

powering the compressor motor from a main power source during said normal mode;

adjusting said variable capacity compressor from said first capacity to a second capacity of the fuel cell system to produce electrical power when in a rapid transient mode at or above a threshold rate of 40%/s change in capacity; and

when in said rapid transient mode either:

a) powering the compressor motor from a supplemental power source when said rapid transient mode is an upward rapid transient mode, or

b) regeneratively braking the compressor motor to produce charging current for said supplemental power source when operating in said rapid transient mode which is a downward rapid transient mode.

22. The method of claim 21 wherein said second capacity is greater than said first capacity when operating in said upward rapid transient mode.

23. The method of claim 21 wherein said second capacity is less than said first capacity wherein operating in said downward rapid transient mode.

24. The method of claim 21 wherein said supplemental power source is a capacitor.
25. The method of claim 21 further comprising charging said supplemental power source during said normal mode.
26. The method of claim 21 further comprising using power from said supplemental power source to increase speed of the compressor motor when in said upward rapid transient mode.